

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Lee, et al

Serial No.: 10/824,035

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Group Art Unit: 2811

Examiner: Vu, Hung K.

Docket No. 252011-2220

Top-Team ref: 0503-A30220US

For: **BONDING PAD STRUCTURE AND METHOD OF FORMING THE SAME**

AMENDMENT AND RESPONSE TO OFFICE ACTION

Mail Stop – Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

The Office Action mailed on June 15, 2006, has been carefully considered. In response thereto, Applicants hereby submit the following remarks.

In the Claims

This listing of claims will replace all prior versions, and listings, of claims.

Listing of Claims

1. (Currently amended) A bonding pad structure, comprising:

a bonding pad substantially surrounded and insulated by a dielectric layer, wherein the bonding pad comprises at least one first conductive layer having a wiring layer with a stripe layout and a first edge portion, a second conductive layer having a wire bonding portion and a second edge portion and a plurality of plugs electrically connecting the wiring layer and the wire bonding portion; and

[[a]] an array of conductive structures surrounding the

wire bonding portion, connecting the first edge portion and the second edge portion, wherein the conductive structures comprising a formation of at least two rows.

2. (Original) The structure according to claim 1, further comprising:

an electrostatic discharge (ESD) protection device electrically connected to the first conductive layer.

3. (Original) The structure according to claim 1, wherein a material of the dielectric layer is a low dielectric constant material.

4. (Original) The structure according to claim 1, wherein the first conductive layer is a metal layer.

5. (Original) The structure according to claim 1, wherein the second conductive layer is a metal layer.

6-7. (Cancelled)

8. (Currently amended) A bonding pad structure, comprising:
a substrate having an interlevel dielectric (ILD) layer thereon,
a bonding pad formed on the ILD layer and substantially surrounded and insulated by an intermetal dielectric (IMD) layer, wherein the bonding pad comprises at least one metal layer having a wiring layer with a stripe layout and a first edge portion, a bonding metal layer having a wire bonding portion and a second edge portion and a plurality of plugs electrically connecting the wiring layer and the wire bonding portion; and

[[a]] an array of conductive structures surrounding the wire bonding portion, connecting the first edge portion and the second edge portion, wherein the conductive structures comprising a formation of at least two rows.

9. (Original) The structure according to claim 8, further comprising:
an electrostatic discharge (ESD) protection device electrically connected to the first conductive layer.

10. (Original) The structure according to claim 8, wherein a material of the IMD layer is a low dielectric constant material.

11-23. (Cancelled).

24. (Currently amended) A bonding pad structure, comprising:

a bonding pad substantially surrounded and insulated by a dielectric layer, wherein the bonding pad comprises at least one first conductive layer having a wiring layer with a stripe layout and a first edge portion, a second conductive layer having a wire bonding portion and a second edge portion and a plurality of first plugs electrically connecting the wiring layer and the wire bonding portion; and

an array of ~~metal~~ second plugs connecting the first edge portion and the second edge portion, wherein each of the second plugs has a dimension smaller than one of each of the first plugs.

25. (Previously presented) The structure according to claim 24, further comprising:

an electrostatic discharge (ESD) protection device electrically connected to the first conductive layer.

26. (Previously presented) The structure according to claim 24, wherein a material of the dielectric layer is a low dielectric constant material.

27. (Previously presented) The structure according to claim 24, wherein the first conductive layer is a metal layer.

28. (Previously presented) The structure according to claim 24, wherein the first conductive layer is a metal layer.

REMARKS

Claims 1, 8 and 24 have been amended. Claims 6-7, 11-12 and 13-23 have been cancelled. Claims 2-5, 9-10 and 25-28 remain in this application. Applicant has corrected minor editorial problems of claims 1, 8 and 24. These features were defined in the claims as original filed, and therefore add no new matter to this application.

Piecemeal Examination is to be Avoided

The present Office Action has recanted certain allowable subject matter. The Office Action states that this resulted from an updated search. The undersigned notes, however, that the newly cited reference is U.S. patent 5,736,791. This patent was issued well before the previous search. Therefore, the new rejections appear to result more from an incomplete initial search, as opposed to merely an updated search. The undersigned notes the MPEP's admonition against piecemeal examination. Such piecemeal examination imposes an undue cost on applicants in the examination process.

In responding to the present rejection, Applicant assumes that the Examiner has now made all relevant art of record, as the MPEP requires that Examiners avoid piecemeal examination of applications (MPEP 707.07(g)), and that the art now of record reflects the results of a thorough search of the embodiments of the specification as well as the claims (MPEP 904).

Turning to the substantive rejections, the Office Action has rejected claims 1, 4-6, 8, 11, 24, 27, and 28 under 35 U.S.C. §102(b) as allegedly unpatentable over U.S. patent 5,736,791 to Fujiki. In response, claims 1 and 8 have been amended to more clearly identify novel feature of the claimed

invention. Specifically, Claims 1 and 8 has been amended to expressly recite, **“an array of conductive structures surrounding the wire bonding portion, connecting the first edge portion and the second edge portion, wherein the conductive structures comprising a formation of at least two rows”**. Support for this amendment is found at least on page 8 lines 25-27 and FIG. 5A of the drawings, of the original-filed application. Accordingly, the amendment adds no new matter to the application.

Claim 24 has been amended to more clearly identify novel feature of the claimed embodiments. Specifically, claim 24 has been amended to recite, **“wherein each of the second plugs has a dimension smaller than one of each of the first plugs”**. Support for this amendment is found at least in FIGs. 4-5B of the originally-filed drawings, and therefore this amendment adds no new matter to the application.

In view of the amendment to claims 1, 8, 24 and the comment below, Applicant respectfully requests that the rejection be withdrawn. In this regard, the Office rejected independent claims 1, 8, and 24 under 35 U.S.C. 102(b) as allegedly anticipated by Fujiki. However, Fujiki discloses a bonding pad structure, **wherein one row of via holes 5 is formed on the peripheral of second wire layer 6**. Thus, **the via holes 5 are not formed of at least two rows surrounding the wire bonding portion**, as expressly claimed in each of claims 1, 8, and 24 (as amended herein). According to the bonding pad structure in Fijiki, **all of the via holes 5 have the same dimension**. Thus, **the dimension of outer via holes 5 formed on peripheral of second wire layer 6 is not smaller than the one of the others**. (see column 9 lines 6-60 and FIGs. 1-3 of Fijiki)

As Fujiki does not disclose all of the limitations recited in claims 1, 8, and 24 of the present application, then these claims patently define over Fjuiki for at least this reason. Insofar as claims 2-

5 depend from claim 1, claims 9-10 depend from claim 8, and claims 25-28 depend from claim 24, these claims are also allowable for at least the same reasons.

In addition, the Office Action rejected claims 2, 3, 9, 10, 25, and 26 under 35 U.S.C. § 103(a) as allegedly unpatentable over the combination of Fujiki in view of Huang (USP 6,762,466). These rejections should be withdrawn for at least the reason that these claims depend from claim 1, 8, or 24.

As a separate and independent basis for the patentability of claims 2, 3, 9, 10, 25, and 26, Applicant respectfully submits that the Office Action has failed to cite a proper motivation or suggestion for combining the Huang and Fujiki references. The Office Action alleged that the combination of Huang with Fujiki would have been obvious “in order to protect the circuit from electrostatic discharge.” (Office Action, p. 4) This alleged motivation clearly fails to comply with well-established Federal Circuit precedent for rejections under 35 U.S.C. § 103(a).

It is well-settled law that in order to properly support an obviousness rejection under 35 U.S.C. § 103, there must have been some teaching in the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. W. L. Gore & Associates, Inc. v. Garlock Thomas, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983). More significantly,

"The consistent criteria for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this [invention] should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. ..." Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure... In determining whether such a suggestion can fairly be gleaned from the prior art, the full field of the invention must be considered; for the person of ordinary skill in the art is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention."

(*Emphasis added.*) In re Dow Chemical Company, 837 F.2d 469, 473 (Fed. Cir. 1988).

In this regard, Applicant notes that there must not only be a suggestion to combine the functional or operational aspects of the combined references, but that the Federal Circuit also requires the prior art to suggest both the combination of elements and the structure resulting from the combination. Stiftung v. Renishaw PLC, 945 Fed.2d 1173 (Fed. Cir. 1991). Therefore, in order to sustain an obviousness rejection based upon a combination of any two or more prior art references, the prior art must properly suggest the desirability of combining the particular elements to derive a bonding pad structure, as claimed by the Applicant.

When an obviousness determination is based on multiple prior art references, there must be a showing of some “teaching, suggestion, or reason” to combine the references. Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997) (also noting that the “absence of such a suggestion to combine is dispositive in an obviousness determination”).

Evidence of a suggestion, teaching, or motivation to combine prior art references may flow, inter alia, from the references themselves, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. See In re Dembiczak, 175 F.3d 994, 1000, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Although a reference need not expressly teach that the disclosure contained therein should be combined with another, the showing of combinability, in whatever form, must nevertheless be “clear and particular.” Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617.

If there was no motivation or suggestion to combine selective teachings from multiple prior art references, one of ordinary skill in the art would not have viewed the present invention as obvious. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); Gambro Lundia AB, 110 F.3d at 1579, 42 USPQ2d at 1383 (“The absence of such a suggestion to combine is dispositive in an obviousness determination.”).

Significantly, where there is no apparent disadvantage present in a particular prior art reference, then generally there can be no motivation to combine the teaching of another reference with the particular prior art reference. Winner Int'l Royalty Corp. v. Wang, No 98-1553 (Fed. Cir. January 27, 2000).

For at least this additional reason that the Office Action failed to identify proper motivations or suggestions for combining the various references to properly support the rejections under 35 U.S.C. § 103, the rejection of claims 1-5 and 8-10 should be withdrawn.

All pending claims are believed to be in condition for allowance, and the Examiner is respectfully requested to pass those claims to issuance. If the Examiner believes a teleconference will expedite the examination of this application, the Examiner is invited to contact the undersigned attorney at 770-933-9500.

No fee is believed to be due in connection with this Amendment and Response to Office Action. If, however, any fee is deemed to be payable, you are hereby authorized to charge any such fee to deposit account 20-0778.

Respectfully submitted ,

By: 

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